

CLAIMS

1. A liquid discharging apparatus for discharging droplets from a liquid discharge nozzle to a discharge  
5 object to be discharged, the liquid discharging apparatus including a liquid discharge head having a liquid discharge surface provided with the liquid discharge nozzle, the liquid discharging apparatus comprising:

10 a platen plate for supporting the discharge object, defining a positional relationship between the discharge object and the liquid discharge head, and receiving the droplets discharged from the liquid discharge head,

wherein droplets are preliminarily discharged from the liquid discharge nozzle to the platen plate.

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2. The liquid discharging apparatus according to Claim 1, further comprising discharge controlling means for controlling a discharge operation of discharging the droplets from the liquid discharge nozzle in the liquid  
20 discharge surface, wherein, at a time when an operation of discharging liquid to the discharge object begins, preliminary discharge is performed to the platen plate.

3. The liquid discharging apparatus according to Claim 1,  
25 further comprising discharge controlling means for

controlling a discharge operation of discharging the droplets from the liquid discharge nozzle in the liquid discharge surface, wherein, at a time when an operation of discharging liquid to the discharge object ends, preliminary  
5 discharge is performed to the platen plate.

4. The liquid discharging apparatus according to Claim 1, further comprising discharge controlling means for controlling a discharge operation of discharging the  
10 droplets from the liquid discharge nozzle in the liquid discharge surface, wherein, after an operation of discharging liquid to the discharge object begins, every time the number of printed pages of the discharge object reaches a predetermined number, the operation of discharging  
15 liquid is temporarily stopped, and droplets are preliminarily discharged from the liquid discharge nozzle to the platen plate by control of the discharge controlling means.

20 5. The liquid discharging apparatus according to Claim 1, further comprising discharge controlling means for controlling a discharge operation of discharging the droplets from the liquid discharge nozzle in the liquid discharge surface, wherein, after an operation of  
25 discharging liquid to the discharge object begins, every

time a predetermined period of time elapses, the operation of discharging liquid is temporarily stopped, and droplets are preliminarily discharged from the liquid discharge nozzle to the platen plate by control of the discharge  
5 controlling means.

6. A liquid discharging apparatus for discharging droplets from a liquid discharge nozzle to a discharge object to be discharged, the liquid discharging apparatus  
10 including a liquid discharge head having a liquid discharge surface provided with the liquid discharge nozzle, the liquid discharging apparatus comprising:

a cleaning member formed of an elastic material and having a cylindrical shape;

15 moving means for causing relative movement between the cleaning member and the liquid discharge surface while an outer face of the cleaning member is in contact with the liquid discharge surface of the liquid discharge head;

drive controlling means for controlling driving of the  
20 moving means;

discharge controlling means for controlling a discharge operation of discharging the droplets from the liquid discharge nozzle in the liquid discharge surface; and

a platen plate for supporting the discharge object,  
25 defining a positional relationship between the discharge

object and the liquid discharge head, and receiving the droplets discharged from the liquid discharge head,

wherein liquid present in the liquid discharge nozzle is sucked by performing movement while the outer face of the cleaning member is in contact with the liquid discharge surface by driving of the moving means under control of the drive controlling means, and, after the cleaning member has passed over the liquid discharge surface, droplets are preliminarily discharged from the liquid discharge nozzle to the platen plate by control of the discharge controlling means.

7. The liquid discharging apparatus according to Claim 6, wherein, at a time when an operation of discharging liquid to the discharge object begins, liquid present in the liquid discharge nozzle is sucked by performing movement while the outer face of the cleaning member is in contact with the liquid discharge surface by driving of the moving means under control of the drive controlling means, and, after the cleaning member has passed over the liquid discharge surface, droplets are preliminarily discharged from the liquid discharge nozzle to the platen plate by control of the discharge controlling means.

8. The liquid discharging apparatus according to Claim 6,

wherein, at a time when an operation of discharging liquid to the discharge object ends, liquid present in the liquid discharge nozzle is sucked by performing movement while the outer face of the cleaning member is in contact with the liquid discharge surface by driving of the moving means under control of the drive controlling means, and, when the cleaning member moves the liquid discharge surface, droplets are preliminarily discharged from the liquid discharge nozzle to the platen plate by control of the discharge controlling means.

9. The liquid discharging apparatus according to Claim 6, wherein, after an operation of discharging liquid to the discharge object begins, every time the number of printed pages of the discharge object reaches a predetermined number, the operation of discharging liquid is temporarily stopped, and droplets are preliminarily discharged from the liquid discharge nozzle to the platen plate by control of the discharge controlling means.

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10. The liquid discharging apparatus according to Claim 6, further comprising discharge controlling means for controlling a discharge operation of discharging the droplets from the liquid discharge nozzle in the liquid discharge surface, wherein, after an operation of

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discharging liquid to the discharge object begins, every time a predetermined period of time elapses, the operation of discharging liquid is temporarily stopped, and droplets are preliminarily discharged from the liquid discharge  
5 nozzle to the platen plate by control of the discharge controlling means.

11. The liquid discharging apparatus according to Claim 6, further comprising a cap member for accommodating the  
10 cleaning member therein and protecting the liquid discharge surface of the liquid discharge head, wherein the cap member is opened and closed by driving of the moving means, relative movement between the cleaning member and the liquid discharge surface while the outer face of the cleaning  
15 member is in contact with the liquid discharge surface of the liquid discharge head is caused as the cap member is opened, and, after the cleaning member has passed over the liquid discharge surface, droplets are preliminarily discharged from the liquid discharge nozzle to the platen  
20 plate by control of the discharge controlling means.

12. The liquid discharging apparatus according to Claim 6, further comprising a cap member for accommodating the  
cleaning member therein and protecting the liquid discharge  
25 surface of the liquid discharge head, wherein the cap member

temporarily closed is reopened and reclosed by driving of the moving means, relative movement between the cleaning member and the liquid discharge surface while the outer face of the cleaning member is in contact with the liquid  
5 discharge surface of the liquid discharge head is caused as the cap member is opened, and, after the cleaning member has passed over the liquid discharge surface, droplets are preliminarily discharged from the liquid discharge nozzle to the platen plate by control of the discharge controlling  
10 means.

13. The liquid discharging apparatus according to Claim 6, further comprising a cap member for accommodating the cleaning member therein and protecting the liquid discharge  
15 surface of the liquid discharge head, wherein the cap member is opened and closed by driving of the moving means, and, before relative movement between the cleaning member and the liquid discharge surface while the outer face of the cleaning member is in contact with the liquid discharge  
20 surface of the liquid discharge head is caused as the cap member is closed, droplets are preliminarily discharged from the liquid discharge nozzle to the platen plate.

14. The liquid discharging apparatus according to Claim 1  
25 or Claim 6, wherein the platen plate is formed such that the

droplets preliminarily discharged from the liquid discharge nozzle flow out of the platen plate.

15. The liquid discharging apparatus according to Claim  
5 or Claim 6, wherein the platen plate is formed such that the droplets preliminarily discharged from the liquid discharge nozzle are forced out of the platen plate.

16. A liquid discharging apparatus for discharging  
10 droplets from liquid discharge nozzles to a discharge object to be discharged, the liquid discharging apparatus including a liquid discharge head having a liquid discharge surface provided with rows of the liquid discharge nozzles for a plurality of colors, each row of the liquid discharge  
15 nozzles corresponding to one color, the liquid discharging apparatus comprising:

a cleaning member formed of an elastic material and having a cylindrical shape;

a cap member for accommodating the cleaning member  
20 therein and protecting the liquid discharge surface of the liquid discharge head;

cap opening and closing means for opening and closing the cap member and for, as the cap member is opened, causing relative movement between the cleaning member and the liquid  
25 discharge surface in a direction perpendicular to the rows



of the liquid discharge nozzles for the colors while an outer face of the cleaning member is in contact with the liquid discharge surface of the liquid discharge head;

drive controlling means for controlling driving of the  
5 cap opening and closing means;

discharge controlling means for controlling a discharge operation of discharging the droplets from the liquid discharge nozzles of the liquid discharge surface; and

a platen plate for supporting the discharge object,  
10 defining a positional relationship between the discharge object and the liquid discharge head, and receiving the droplets discharged from the liquid discharge head,

wherein, at a time when an operation of discharging liquid to the discharge object begins, the cap member is  
15 opened by driving of the cap opening and closing means under control of the drive controlling means, liquid present in the liquid discharge nozzles is sucked by performing movement while the outer face of the cleaning member is in contact with the liquid discharge surface, and, after the  
20 cleaning member has passed over the liquid discharge surface, droplets are preliminarily discharged from the liquid discharge nozzles to the platen plate by control of the discharge controlling means.

25 17. A liquid discharging apparatus for discharging

droplets from liquid discharge nozzles to a discharge object to be discharged, the liquid discharging apparatus including a liquid discharge head having a liquid discharge surface provided with rows of the liquid discharge nozzles for a plurality of colors, each row of the liquid discharge nozzles corresponding to one color, the liquid discharging apparatus comprising:

a cleaning member formed of an elastic material and having a cylindrical shape;

a cap member for accommodating the cleaning member therein and protecting the liquid discharge surface of the liquid discharge head;

cap opening and closing means for opening and closing the cap member and for, as the cap member is opened, causing relative movement between the cleaning member and the liquid discharge surface in a direction perpendicular to the rows of the liquid discharge nozzles for the colors while an outer face of the cleaning member is in contact with the liquid discharge surface of the liquid discharge head;

drive controlling means for controlling driving of the cap opening and closing means;

discharge controlling means for controlling a discharge operation of discharging the droplets from the liquid discharge nozzles of the liquid discharge surface; and

a platen plate for supporting the discharge object,

defining a positional relationship between the discharge object and the liquid discharge head, and receiving the droplets discharged from the liquid discharge head,

wherein, at a time when an operation of discharging liquid to the discharge object ends, the cap member temporarily closed is reopened and reclosed by driving of the moving means under control of the drive controlling means, liquid present in the liquid discharge nozzles is sucked by performing movement while the outer face of the cleaning member is in contact with the liquid discharge surface, and, after the cleaning member has passed over the liquid discharge surface, droplets are preliminarily discharged from the liquid discharge nozzles to the platen plate by control of the discharge controlling means.

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18. A liquid discharging apparatus for discharging droplets from liquid discharge nozzles to a discharge object to be discharged, the liquid discharging apparatus including a liquid discharge head having a liquid discharge surface provided with rows of the liquid discharge nozzles for a plurality of colors, each row of the liquid discharge nozzles corresponding to one color, the liquid discharging apparatus comprising:

a cleaning member formed of an elastic material and having a cylindrical shape;

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a cap member for accommodating the cleaning member therein and protecting the liquid discharge surface of the liquid discharge head;

cap opening and closing means for opening and closing  
5 the cap member and for, as the cap member is closed, causing relative movement between the cleaning member and the liquid discharge surface in a direction perpendicular to the rows of the liquid discharge nozzles for the colors while an outer face of the cleaning member is in contact with the  
10 liquid discharge surface of the liquid discharge head;

drive controlling means for controlling driving of the cap opening and closing means;

discharge controlling means for controlling a discharge operation of discharging the droplets from the liquid  
15 discharge nozzles of the liquid discharge surface; and

a platen plate for supporting the discharge object, defining a positional relationship between the discharge object and the liquid discharge head, and receiving the droplets discharged from the liquid discharge head,

20 wherein, at a time when an operation of discharging liquid to the discharge object ends, before the cap member is closed by driving of the cap opening and closing means under control of the drive controlling means and movement while the outer face of the cleaning member is in contact  
25 with the liquid discharge surface is caused, droplets are

preliminarily discharged from the liquid discharge nozzles to the platen plate.

19. A liquid discharging apparatus for discharging  
5 droplets from liquid discharge nozzles to a discharge object to be discharged, the liquid discharging apparatus including a liquid discharge head having a liquid discharge surface provided with rows of the liquid discharge nozzles for a plurality of colors, each row of the liquid discharge  
10 nozzles corresponding to one color, the liquid discharging apparatus comprising:

a cleaning member formed of an elastic material and having a cylindrical shape;

a cap member for accommodating the cleaning member  
15 therein and protecting the liquid discharge surface of the liquid discharge head;

cap opening and closing means for opening and closing the cap member and for, as the cap member is opened, causing relative movement between the cleaning member and the liquid  
20 discharge surface in a direction perpendicular to the rows of the liquid discharge nozzles for the colors while an outer face of the cleaning member is in contact with the liquid discharge surface of the liquid discharge head;

drive controlling means for controlling driving of the  
25 cap opening and closing means;

discharge controlling means for controlling a discharge operation of discharging the droplets from the liquid discharge nozzles of the liquid discharge surface; and

a platen plate for supporting the discharge object,  
5 defining a positional relationship between the discharge object and the liquid discharge head, and receiving the droplets discharged from the liquid discharge head,

wherein, after an operation of discharging liquid to the discharge object begins, every time the number of  
10 printed pages of the discharge object reaches a predetermined number, the operation of discharging liquid is temporarily stopped, the cap member is reopened after the cap member is temporarily closed by driving of the cap opening and closing means under control of the drive  
15 controlling means, liquid present in the liquid discharge nozzles is sucked by performing movement while the outer face of the cleaning member is in contact with the liquid discharge surface as the cap member is reopened, and, after the cleaning member has passed over the liquid discharge  
20 surface, droplets are preliminarily discharged from the liquid discharge nozzles to the platen plate by control of the discharge controlling means.

20. A liquid discharging apparatus for discharging  
25 droplets from liquid discharge nozzles to a discharge object

to be discharged, the liquid discharging apparatus including a liquid discharge head having a liquid discharge surface provided with rows of the liquid discharge nozzles for a plurality of colors, each row of the liquid discharge

5 nozzles corresponding to one color, the liquid discharging apparatus comprising:

a cleaning member formed of an elastic material and having a cylindrical shape;

a cap member for accommodating the cleaning member  
10 therein and protecting the liquid discharge surface of the liquid discharge head;

cap opening and closing means for opening and closing the cap member and for, as the cap member is closed, causing relative movement between the cleaning member and the liquid  
15 discharge surface in a direction perpendicular to the rows of the liquid discharge nozzles for the colors while an outer face of the cleaning member is in contact with the liquid discharge surface of the liquid discharge head;

drive controlling means for controlling driving of the  
20 cap opening and closing means;

discharge controlling means for controlling a discharge operation of discharging the droplets from the liquid discharge nozzles of the liquid discharge surface; and

a platen plate for supporting the discharge object,  
25 defining a positional relationship between the discharge

object and the liquid discharge head, and receiving the droplets discharged from the liquid discharge head,

wherein, after an operation of discharging liquid to the discharge object begins, every time the number of  
5 printed pages of the discharge object reaches a predetermined number, the operation of discharging liquid is temporarily stopped, the cap member is temporarily closed by driving of the cap opening and closing means under control of the drive controlling means, the cap member is reopened  
10 after liquid present in the liquid discharge nozzles is sucked by performing movement while the outer face of the cleaning member is in contact with the liquid discharge surface, and, after the cleaning member has passed over the liquid discharge surface, droplets are preliminarily  
15 discharged from the liquid discharge nozzles to the platen plate by control of the discharge controlling means.

21. A liquid discharging apparatus for discharging droplets from liquid discharge nozzles to a discharge object  
20 to be discharged, the liquid discharging apparatus including a liquid discharge head having a liquid discharge surface provided with rows of the liquid discharge nozzles for a plurality of colors, each row of the liquid discharge nozzles corresponding to one color, the liquid discharging  
25 apparatus comprising:



a cleaning member formed of an elastic material and having a cylindrical shape;

a cap member for accommodating the cleaning member therein and protecting the liquid discharge surface of the liquid discharge head;

cap opening and closing means for opening and closing the cap member and for, as the cap member is opened, causing relative movement between the cleaning member and the liquid discharge surface in a direction perpendicular to the rows of the liquid discharge nozzles for the colors while an outer face of the cleaning member is in contact with the liquid discharge surface of the liquid discharge head;

drive controlling means for controlling driving of the cap opening and closing means;

discharge controlling means for controlling a discharge operation of discharging the droplets from the liquid discharge nozzles of the liquid discharge surface; and

a platen plate for supporting the discharge object, defining a positional relationship between the discharge object and the liquid discharge head, and receiving the droplets discharged from the liquid discharge head,

wherein, after an operation of discharging liquid to the discharge object begins, every time a predetermined period of time elapses, the operation of discharging liquid is temporarily stopped, the cap member is reopened after the

cap member is temporarily closed by driving of the cap opening and closing means under control of the drive controlling means, liquid present in the liquid discharge nozzles is sucked by performing movement while the outer  
5 face of the cleaning member is in contact with the liquid discharge surface as the cap member is reopened, and, after the cleaning member has passed over the liquid discharge surface, droplets are preliminarily discharged from the liquid discharge nozzles to the platen plate by control of  
10 the discharge controlling means.

22. A liquid discharging apparatus for discharging droplets from liquid discharge nozzles to a discharge object to be discharged, the liquid discharging apparatus including  
15 a liquid discharge head having a liquid discharge surface provided with rows of the liquid discharge nozzles for a plurality of colors, each row of the liquid discharge nozzles corresponding to one color, the liquid discharging apparatus comprising:

20 a cleaning member formed of an elastic material and having a cylindrical shape;

a cap member for accommodating the cleaning member therein and protecting the liquid discharge surface of the liquid discharge head;

25 cap opening and closing means for opening and closing

the cap member and for, as the cap member is closed, causing relative movement between the cleaning member and the liquid discharge surface in a direction perpendicular to the rows of the liquid discharge nozzles for the colors while an

5 outer face of the cleaning member is in contact with the liquid discharge surface of the liquid discharge head;

drive controlling means for controlling driving of the cap opening and closing means;

10 discharge controlling means for controlling a discharge operation of discharging the droplets from the liquid discharge nozzles of the liquid discharge surface; and

a platen plate for supporting the discharge object, defining a positional relationship between the discharge object and the liquid discharge head, and receiving the  
15 droplets discharged from the liquid discharge head,

wherein, after an operation of discharging liquid to the discharge object begins, every time a predetermined period of time elapses, the operation of discharging liquid is temporarily stopped, the cap member is temporarily closed  
20 by driving of the cap opening and closing means under control of the drive controlling means, the cap member is reopened after liquid present in the liquid discharge nozzles is sucked by performing movement while the outer face of the cleaning member is in contact with the liquid  
25 discharge surface, and, after the cleaning member has passed

over the liquid discharge surface, droplets are preliminarily discharged from the liquid discharge nozzles to the platen plate by control of the discharge controlling means.

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23. The liquid discharging apparatus according to any one of Claims 16, 17, and 19 to 22, wherein, in the order in which the cleaning member has passed over the rows of the liquid discharge nozzles corresponding to the colors,  
10 droplets are preliminarily discharged from the liquid discharge nozzles by control of the discharge controlling means.

24. The liquid discharging apparatus according to any one  
15 of Claims 16, 17, and 19 to 22, wherein, after the cleaning member has passed over the rows of the liquid discharge nozzles corresponding to the colors, droplets corresponding to the plurality of colors are preliminarily discharged from the liquid discharge nozzles in a simultaneous manner by  
20 control of the discharge controlling means.

25. The liquid discharging apparatus according to Claim 18, wherein, before the cap member is closed by driving of the cap opening and closing means by control of the drive  
25 controlling means and movement while the outer face of the

cleaning member is in contact with the liquid discharge surface is caused, in the order in which the cleaning member passes over the rows of the liquid discharge nozzles corresponding to the colors, droplets are preliminarily  
5 discharged from the liquid discharge nozzles.

26. A method for controlling a liquid discharging apparatus for discharging droplets from a liquid discharge nozzle to a discharge object to be discharged, the liquid  
10 discharging apparatus including a liquid discharge head having a liquid discharge surface provided with the liquid discharge nozzle,

the liquid discharging apparatus being provided with a platen plate for supporting the discharge object, defining a  
15 positional relationship between the discharge object and the liquid discharge head, and receiving the droplets discharged from the liquid discharge head, the method comprising:

preliminarily discharging droplets from the liquid discharge nozzle to the platen plate.

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27. The method for controlling the liquid discharging apparatus according to Claim 26, the method further comprising performing preliminary discharge to the platen plate at a time when an operation of discharging liquid to  
25 the discharge object begins.

28. The method for controlling the liquid discharging apparatus according to Claim 26, the method further comprising performing preliminary discharge to the platen  
5 plate at a time when an operation of discharging liquid to the discharge object ends.

29. The method for controlling the liquid discharging apparatus according to Claim 26, the method further  
10 comprising temporarily stopping an operation of discharging liquid and preliminarily discharging droplets from the liquid discharge nozzle to the platen plate, every time the number of printed pages of the discharge object reaches a predetermined number, after the operation of discharging  
15 liquid to the discharge object begins.

30. The method for controlling the liquid discharging apparatus according to Claim 26, the method further comprising temporarily stopping an operation of discharging  
20 liquid and preliminarily discharging droplets from the liquid discharge nozzle to the platen plate, every time a predetermined period of time elapses, after the operation of discharging liquid to the discharge object begins.